WHAT IS CLAIMED IS:

1. A method of determining a composition of an integrated circuit feature, comprising:

collecting intensity data representative of spectral wavelengths of radiant energy generated by a plasma during plasma nitridation of an integrated circuit feature disposed on a substrate;

analyzing said intensity data to determine a peak intensity at one of said wavelengths; and

determining a component concentration of said integrated circuit feature based on said peak intensity.

2. The method as recited in Claim 1 wherein said integrated circuit feature is a nitrided gate oxide.

3. The method as recited in Claim 2 wherein said component is nitrogen.

4. The method as recited in Claim 1 wherein said one of said wavelengths is between about 290 nm and about 400 nm.

5. The method as recited in Claim 4 wherein said one of said wavelengths is about 308 nm.

6. The method as recited in Claim 4 wherein said one of said wavelengths is about 329 nm.

7. The method as recited in Claim 1 wherein said component concentration is related to said peak intensity as estimated by the equation $y = -1.02E16 + 2.53E15 \ln(x)$, wherein x is said peak intensity and y is said component concentration.

8. The method as recited in Claim 1 wherein said method is an in-situ, real-time monitoring method.

9. A method of manufacturing a semiconductor device, comprising:

forming an integrated circuit feature on a substrate;

nitriding said integrated circuit feature using a plasma;

collecting intensity data representative of spectral wavelengths of optical energy emitted by said plasma during said nitriding;

analyzing said intensity data to determine a peak intensity at one of said wavelengths; and

estimating a component concentration of said integrated circuit feature based on said peak intensity.

10. The method as recited in Claim 9 further comprising adjusting at least one parameter of said process based upon said intensity data analysis.

11. The method as recited in Claim 10 further comprising adjusting said parameter to achieve said component concentration at about 1E14 to 5E15 atoms/cm^2.

12. The method as recited in Claim 10 wherein said parameter is one selected from the group consisting of: RF power, microwave power, pressure, and temperature.

13. The method as recited in Claim 9 wherein said integrated circuit feature is a gate oxide.

14. The method as recited in Claim 13 wherein said component is nitrogen.

15. The method as recited in Claim 9 wherein said method is an in-situ, real-time monitoring method.

16. The method as recited in Claim 9 wherein said one of said wavelengths is between about 290 nm and about 400 nm.

17. The method as recited in Claim 16 wherein said one of said wavelengths is selected from the group consisting of: about 308 nm, and about 329 nm.

18. The method as recited in Claim 9 wherein said component concentration is related to said peak intensity as estimated by the equation $y = -1.02E16 + 2.53E15 \ln(x)$, wherein x is said peak intensity and y is said component concentration.

19. The method as recited in Claim 9 wherein said integrated circuit feature has a thickness ranging between about 13 Angstroms and about 17 Angstroms.

20. A plasma system comprising:

a plasma chamber for containing a plasma;

means for controlling a plasma nitridation process of a feature on a semiconductor substrate located within said chamber;

an optical sensor capable of detecting optical emissions from said plasma during said plasma nitridation process;

an optical spectral analyzer for analyzing said optical emissions detected by said optical sensor to determine a peak intensity of at least one emitted wavelength; and

means for determining a component concentration of said feature based on said peak intensity.